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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,416	06/04/2001	Curt Zimmermann	2001-0662A	3348

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EXAMINER	
LEWIS, PATRICK T	

ART UNIT	PAPER NUMBER
1623	

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/857,416	ZIMMERMANN ET AL.	
	Examiner	Art Unit	
	Patrick T. Lewis	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 06042001.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Priority

2. It is noted that this application appears to claim subject matter disclosed in prior Application No. PCT/EP99/09517, filed December 6, 1999. A reference to the prior application must be inserted as the first sentence of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e) or 120. See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. Also, the current status of all nonprovisional parent applications referenced should be included.

If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000,

after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e), 120, 121 and 365(c). A priority claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed claim for priority under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "following a) and b), the acetal is cleaved to give the desired free glyoxylic ester or its hydrate" of claim 1 renders the claim indefinite. The claim as presently constructed lacks clarity. First, it is noted that steps a) and b) are recited in the alternative which means that either step a) is performed or, alternatively, step b) is performed (not both). Since step a) does not result in the formation of an acetal, the recited phrase above lacks antecedent basis in regards to a). Also, it is not clear what the "desired" product is as the products obtained using a) vs. b) are different [hemiacetal is not cleaved using step a)].

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krasik *Tetrahedron Letters* (1998), Vol. 39, pages 4223-4226 (Krasik) in combination with Algieri et al. US 4,927,968 (Algieri) and Schaefer et al. US 5,380,794 (Schaefer).

Claims 1-9 are drawn to a process for preparing glyoxylic esters comprising a) transesterifying a glyoxylic ester hemiacetal directly with an alcohol in the presence of a catalyst, or b) first converting a glyoxylic ester hemiacetal into the corresponding glyoxylic ester acetal and then transesterifying it with an alcohol in the presence of a catalyst; following a) and b), the acetal is cleaved to give the desired free glyoxylic ester or its hydrate. Claim 2 limits the hemiacetal employed. Claims 3-5 limit the alcohol employed. Claims 6-7 limit the catalyst employed in transesterification. Claims 8-9 limit the acid catalyst.

Krasik teaches the transestrification of glyoxylic ester acetals using titanium (IV) ethoxide as a catalyst (Page 4223; page 4225, Table 3). Using titanium (IV) alkoxide as

a catalyst allows transesterification to be carried out under neutral conditions compatible with a large variety of acid and base sensitive functional groups. Menthyl esters were generated in clean high yielding reactions with no significant by-products. Titanium (IV) alkoxides have also been used to prepare esters of primary and secondary alcohols.

Krasik differs from the instantly claimed invention in that: 1) Krasik does not explicitly teach converting a glyoxylic ester hemiacetal into the corresponding acetal prior to transesterification; 2) Krasik does not explicitly teach the deprotection of the aldehyde moiety (acid hydrolysis of acetals); and 3) Krasik does not explicitly teach the purification of the final product. However, transesterification, removal of acetal protecting groups, and purification of esters by crystallization are very common and routine procedures for one of ordinary skill in the art.

Schaefer teaches that acetals are formed by the well-known reaction between aldehydes and alcohols (column 2, lines 45-54). The addition of one molecule of an alcohol to one molecule of an aldehyde produces a hemiacetal. Hemiacetals are rarely isolated, because of their inherent instability, but rather, are further reacted with another molecule of alcohol to form a stable acetal.

Algieri teaches that aldehydes are prepared from the acid hydrolysis of acetals (column 4, lines 39-52). The hydrolysis reaction may be conducted in a non-reactive solvent such as methanol, ethanol, tetrahydrofuran and aqueous mixtures thereof in the presence of an organic or inorganic acid for example, hydrochloric acid, sulfuric acid, formic acid and p-toluenesulfonic acid.

It would have been obvious to one of ordinary skill in the art at the time of the invention to prepare glyoxylic esters by first converting a glyoxylic ester hemiacetal into the corresponding glyoxylic ester acetal and then transesterifying it with an alcohol in the presence of a catalyst. Although, Krasik does not explicitly teach the conversion of a hemiacetal into the corresponding acetal prior to transesterification, to do so would have been obvious. It is well known in the art that hemiacetals, used to protect aldehyde moieties, are unstable and are usually further converted into the more stable corresponding acetal for use in multi-step chemical reactions. The inherent instability of hemiacetals and general method by which acetals are prepared would have provided motivation to convert a glyoxylic ester hemiacetal into the corresponding acetal prior to transesterification. It would have also been obvious to one of ordinary skill in the art at the time of the invention to remove the protecting groups (acetal/hemiacetal) by acid hydrolysis as that is the standard method for doing so. It would have also been obvious to one of ordinary skill in the art at the time of the invention to purify the ester produced by conventional means such as crystallization. The use of acetals/heimiacetals as protecting groups is widely known in the art. The removal of conventional protecting groups and purification of the resulting ester by conventional means is seen to be well within the purview of one or ordinary skill in the art. The transesterification of glyoxylic ester acetals using titanium catalysts was known in the art at the time of the invention. Once the general reaction has been shown to be old, the burden is on the applicant to present reason or authority for believing that a group on the starting compound would

take part in or affect the basic reaction and thus alter the nature of the product or the operability of the process and thus the unobviousness of the method of producing it.

Conclusion

9. Claims 1-9 are pending. Claims 1-9 are rejected. No claims are allowed.

Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick T. Lewis whose telephone number is 571-272-0655. The examiner can normally be reached on Monday - Friday between 10 am - 2 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick T. Lewis, PhD
Examiner
Art Unit 1623

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